

CLAIMS

Sub B17

1. ~~An aircraft data transmission system, the aircraft having a data acquisition unit,~~
comprising:
a communications unit located in the aircraft and in communication with the data
5 acquisition unit;
a cellular infrastructure in communication with said communications unit after the
aircraft has landed; and
~~a data reception unit in communication with said cellular infrastructure.~~
2. The system of claim 1 wherein said data reception unit is in communication with
10 said cellular infrastructure via the Internet.
3. The system of claim 1 wherein said data reception unit is in communication with
said cellular infrastructure via the public switch telephone network.
4. The system of claim 1 wherein said communications unit has at least one modem
in communication with said cellular infrastructure and said data reception unit has at least
15 one modem in communication with said cellular infrastructure.
5. The system of claim 1 wherein said communications unit includes:
a processor;
a serial card in communication with said processor;
at least one cell channel in communication with said serial card; and
20 at least one antenna in communication with said cell channel.
6. The system of claim 1 wherein said cellular infrastructure includes:
an antenna;
a transceiver subsystem in communication with said antenna; and
a controller in communication with said transceiver subsystem.
7. The system of claim 1 wherein said data reception unit includes:
25 a router; and

a processor in communication with said router, said processor having a storage unit.

- 5 Sub 82
8. A data system for an aircraft, comprising:
a flight data acquisition unit in communication with at least one sensor;
a processor in communication with said digital flight data acquisition unit;
a serial card in communication with said processor; and
a plurality of cell channels in communication with said serial card, said cell channels
for transmitting data via a cellular infrastructure after the aircraft has landed.

9. The system of claim 8 further comprising an antenna in communication with said
cell channels.

10 10. The system of claim 8 wherein said processor includes a personal computer.

11. The system of claim 8 wherein said processor includes an ASIC.

12. The system of claim 8 wherein said processor includes a microprocessor.

13. The system of claim 8 wherein said processor has an I/O interface in

communication with said digital flight data acquisition unit.

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14. An aircraft, comprising:
a digital flight data acquisition unit in communication with at least one sensor; and
a communications unit in communication with said digital flight data acquisition
unit, said communications unit including:

20 a processor in communication with said digital flight data acquisition unit;
a serial card in communication with said processor; and
a plurality of cell channels in communication with said serial card, said cell
channels for transmitting data via a cellular infrastructure after the aircraft has landed.

- 25 15. An aircraft data transmission system, the aircraft having a data acquisition unit,
comprising:
means for transmitting data from the data acquisition unit via a cellular infrastructure
after the aircraft has landed; and

~~means for receiving said data from said cellular infrastructure.~~

Sub a2

16. ~~The system of claim 15 wherein said means for sending data includes a processor.~~

17. The system of claim 15 wherein said means for receiving data includes a processor.

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Sub 1347

18. A method of transmitting aircraft flight data from an aircraft, comprising:

receiving flight data from a data acquisition unit;

transmitting said flight data via a cellular communications infrastructure after the aircraft has landed; and

10 receiving said transmitted flight data.

19. A computer-implemented method of transmitting aircraft flight data from an aircraft, comprising:

receiving flight data from a digital flight data acquisition unit;

processing said flight data to prepare said data for transmission; and

15 transmitting said processed data via a cellular infrastructure after the aircraft has landed.

20. The method of claim 19 further comprising receiving said transmitted data at a flight operations center.

21. The method of claim 20 further comprising receiving said transmitted data and transmitting said received data via the Internet before receiving said transmitted data at a flight operations center.

22. The method of claim 20 further comprising receiving said transmitted data and transmitting said received data via the public-switched telephone network before receiving said transmitted data at a flight operations center.

23. The method of claim 19 wherein processing said flight data includes: compressing said flight data;

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encrypting said flight data;

segmenting said flight data; and

constructing packets of data from said segmented flight data.

24. The method of claim 19 wherein receiving said transmitted data includes:

5 acknowledging receipt of said transmitted data;

reassembling said received data;

decrypting said reassembled data;

uncompressing said decrypted data; and

storing said uncompressed data.

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25. The method of claim 19 wherein processing said flight data includes:

receiving a weight-on-wheels signal;

initiating a data transfer;

compressing said flight data;

encrypting said compressed data;

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creating a packet queue;

starting a primary data thread;

waiting a predetermined period of time;

determining if any threads are active;

repeating, when threads are active, the steps of waiting a predetermined period of

20 time and determining if any threads are active; and

exiting processing said flight data when no threads are active.

Sub a³

26. The method of claim 25 wherein starting a primary data thread includes:

initiating a PPP connection;

initiating a transfer session;

25

starting at least one secondary data thread;

determining if data remains in the primary data thread;

5 sending said data when data remains in the primary data thread;
determining if data threads are active when no data remains in the primary data
thread;

repeating, when said threads are active, the step of determining if data remains in the
5 primary data thread;

ending said session when no threads are active;
closing said PPP connection; and
exiting starting a primary data thread.

27. The method of claim 26 wherein starting at least one secondary data thread
10 includes:

- (a) setting the secondary data thread to active;
- (b) initiating a PPP connection;
- (c) determining if data remains in the secondary data thread;
- (d) sending a data packet when data remains;
- 15 (e) repeating step c when data remains;
- (f) closing said PPP connection when no data remains;
- (g) setting the secondary data thread to inactive;
- (h) exiting starting at least one secondary data thread; and
- (i) repeating steps a through h for each secondary data thread.

20 28. The method of claim 27 wherein repeating steps a through h includes repeating
steps a through h in parallel for each said secondary data thread.

29. The method of claim 20 wherein receiving said transmitted data includes:
creating a socket;
receiving a message;
25 determining if said message is an initialization message;
initiating a session when said message is an initialization message;

determining if said message is a data message when said message is not an initialization message;

processing said message when said message is a data message;

determining if said message is an end session when said message is not a data

5 message;

processing said message when said message is an end session; and

repeating, when said message is not an end session message, the step of receiving a

message.

30. The method of claim 29 wherein initializing a session includes:

allocating buffer space;

sending an initiation session acknowledgment; and

returning to receiving a message.

31. The method of claim 29 wherein processing said message when said message is a data message includes:

15 copying said message to a buffer;

sending a data message acknowledgment; and

returning to receiving a message.

32. The method of claim 29 wherein processing said message when said message is not an end session includes:

20 computing a checksum;

determining if said checksum is valid;

saving a buffer to a temporary file;

decrypting said temporary file;

uncompressing said temporary file;

25 sending an end session acknowledgment; and

returning to receiving a message.

